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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/591,946

11/30/2006

Stephan Oberle

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7590

08/28/2008

NATH & ASSOCIATES  
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Alexandria, VA 22314

EXAMINER

YABUT, DANIEL D

ART UNIT

PAPER NUMBER

4114

MAIL DATE

DELIVERY MODE

08/28/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/591,946	<b>Applicant(s)</b> OBERLE ET AL.	
	<b>Examiner</b> DANIEL YABUT	<b>Art Unit</b> 4114	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/30/2006 and 6/25/2008</u> .                                | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 1 is objected to because of the following informalities: Regarding claim 1, the recitation "the gear wheel are free" in lines 4-5 should be - -the gear wheels are free - - since both the first and second gears (1, 2) are identified. This will be assumed for this Office action. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 7, 8 and 11 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not support the limitation "injection molded onto a hub or a part of a shaft having raised parts and/or depressions on its lower circumference" which is recited on lines 3-5 of claim 11. The specification does not support the limitations regarding "the space width" which is recited on line 4 of claims 7 and 8.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 7 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7 and 8 recite the limitation "the space width" in line 4 of each claim.

There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-5, 9, and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korean PG Pub KR20020046534 in view of Berlinger, Jr. et al., US Patent, 6,101,892. The Examiner has relied on the drawings and the English abstract of Korean PG Pub KR20020046534 for the sake of this Office action. KR20020046534 discloses an engine auxiliary drive (see Fig. 1) comprising a(n):

*Re claim 1*

- First (5) and a second gear wheel (4) with tooth flanks (at 5 and 4, respectively) that are meshed with each other and that the first gear wheel (5) is made of plastic.

*Re claims 2 and 5*

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- Second gear wheel (5) is made of a material with greater strength than the first gear wheel (4), the second gear wheel (5) being metal (see line 6-9 of abstract).

*Re claim 12*

- Engine auxiliary drive driving one or more balancing shafts (see lines 1-3 of abstract)

*Re claim 13*

- First and second gear wheels are designed as helical-toothed spur gears (see helical teeth at 5 and 4, respectively)

However, KR20020046534 **does not** expressly disclose the following limitations:

*Re claim 1*

- Tooth flanks of the gear wheels (5, 4) are free or at least nearly free of involutes in the force transmission area, and transition from a concave area directly or at least nearly directly to a convex area.

*Re claim 3*

- At least sections of the opposing tooth flanks of the gear wheels have nearly the same curvature in their tooth flanks.

*Re claim 4*

- Concave area being situated in an area adjoining a tooth base and the convex area being situated in an area of the respective teeth adjoining a tooth crest.

*Re claim 9*

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- During the rolling off of the gear wheels there are always two or more teeth of the gear wheels meshed with each other.

*Re claim 14*

- The first and second gear wheels are designed as straight-toothed spur gears.

As to claim 1, Berlinger, Jr. et al. teaches the use of tooth flanks (see Fig. 1 and 2) of the gear wheels (10, 12; 20, 22) being free or at least nearly free of involutes (see flanks free of involutes in at least Fig. 2) in the force transmission area (near 10a, 12a, respectively; 20a, 22a, respectively), and transition from a concave area (10b, 12b; 22b, 20b) directly or at least nearly directly to a convex area (10c, 12c; 20c, 22c) for the purpose of reducing contact stress that can reduce the rate of wear of the gears (see column 4, lines 61-65 and column 5, lines 59-64) and thus enhances the performance of the auxiliary drive.

Regarding claim 1, it would have been obvious to one having ordinary skill in the art at the time of the invention to provide tooth flanks of the gear wheels in the device of KR20020046534 that are free or at least nearly free of involutes in the force transmission area, and transition from a concave area directly or at least nearly directly to a convex, as taught by Berlinger, Jr. et al., in the device of KR20020046534 for the purpose of reducing contact stress that can reduce the rate of wear of the gears and thus enhances the performance of the auxiliary drive.

As to claims 3 and 4, Berlinger, Jr. et al. teaches the use of opposing tooth flanks of gear wheels (10, 12) having nearly the same curvature in their tooth flanks (see Fig. 1

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and column 2, lines 38-39) and the use of a concave area (10b; see at least Fig. 1) being situated in an area adjoining a tooth base (near 10b) and a convex area (10c) being situated in an area of the respective teeth adjoining a tooth crest (near 10c) for the purpose of ensuring an angular velocity ratio that is constant during meshing (see column 2, lines 40-41) thus maintaining the consistency and reliability of the auxiliary drive.

Regarding claims 3 and 4, it would have been obvious to one having ordinary skill in the art at the time of the invention to have provided opposing tooth flanks of gear wheels having nearly the same curvature in their tooth flanks and a concave area being situated in an area adjoining a tooth base and a convex area being situated in an area of the respective teeth adjoining a tooth crest, as taught by Berlinger, Jr. et al., in the device of KR20020046534 as modified above for the purpose of ensuring an angular velocity ratio that is constant during meshing thus maintaining the consistency and reliability of the auxiliary drive.

As to claim 9, Berlinger, Jr. et al. teaches that during rolling off of the gear wheels (20, 22) there are always two or more teeth (see teeth in Fig. 2) of the gear wheels meshed together for the purpose of distributing stress and reducing the maximum stress values on all teeth which can increase the lifespan of the auxiliary drive.

Regarding claim 9, it would have been obvious to one having ordinary skill in the art at the time of the invention to provide two or more teeth of the gear wheels always being meshed together during the rolling off of the gear wheels, as taught by Berlinger, Jr. et al., in the device of KR20020046534 as modified above for the purpose of

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distributing stress and reducing the maximum stress values on all teeth which can increase the lifespan of the auxiliary drive.

As to claim 14, Berlinger, Jr. et al. teaches the use of the first and second gear wheels (12, 10) being designed as straight-toothed spur gears (see Fig. 3A) for the purpose of avoiding the resultant thrust along the axis of the gear and that helical gears can produce as well as being easier to manufacture than helical gears.

Regarding claim 14, it would have been obvious to one having ordinary skill in the art at the time of the invention to alternatively provide the first and second gear wheels being designed as straight-toothed spur gears, as taught by Berlinger, in the device of KR20020046534 as modified above for the purpose of avoiding the resultant thrust along the axis of the gear and that helical gears can produce as well as being easier to manufacture than helical gears.

7. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korean PG Pub KR20020046534 and Berlinger, Jr. et al., US Patent, 6,101,892 as applied to claims 1-5 and 12-13 above, and further in view of Pickles, US Patent 2,760,381. KR20020046534 discloses substantial claim limitations (see 103 rejection above) but does **not** expressly disclose the following:

*Re claim 6*

- Tooth thickness of the teeth of the gear wheel made of metal being less than the thickness of the teeth of the plastic gear wheel.

*Re claim 7*



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- The gear wheel made of plastic having a greater tooth width or tooth thickness on the pitch circle of the gear wheel than the space width.

*Re claim 8*

- The gear wheel made of metal having a smaller tooth width or tooth thickness on the pitch circle of the gear wheel than the space width.

As to claims 6-8, Pickles teaches the use of a tooth thickness (T2) of the teeth (14) of a gear wheel (11) made of metal (see column 2, lines 51-53) being less than the thickness (T1) of the teeth of the plastic gear wheel (12) (see column 2, lines 59-65), where the wheel made of plastic (12) has a greater tooth thickness on the pitch circle of the gear wheel than the space width and the wheel made of metal (11) has a smaller tooth thickness on the pitch circle of the gear wheel than the space width (see column 2 lines 30-36) for the purpose of increasing the strength of the plastic gear while not adding unnecessary material to the metal gear wheel (see column 1, lines 60-65) thus providing a mechanism with lighter weight.

Regarding claims 6-8, it would have been obvious to one having ordinary skill at the time of the invention to provide a tooth thickness of the teeth of a gear wheel made of metal being less than the thickness of the teeth of the plastic gear wheel, where the wheel made of plastic has a greater tooth thickness on the pitch circle of the gear wheel than the space width and the wheel made of metal has a smaller tooth thickness on the pitch circle of the gear wheel than the space width, as taught by Pickles, in the device of KR20020046534 as modified above for the purpose of increasing the strength of the

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plastic gear while not adding unnecessary material to the metal gear wheel thus providing a lighter mechanism with lighter weight.

8. Claims 10, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korean PGPub KR20020046534 and Berlinger, Jr. et al., US Patent, 6,101,892 as applied to claims 1-5 and 12-13 above, and further in view of Hiroi et al., PG Pub 2002/0051860. KR20020046534 discloses substantial claim limitations (see 103 rejection above) but does **not** expressly disclose the following:

*Re claim 10*

- The plastic gear wheel is an injection molded part that receives no additional treatment after the injection molding

*Re claim 11*

- The gear wheel made of plastic is injection molded onto a hub or a part of a shaft having raised parts and/or depressions on its outer circumference.

*Re claim 15*

- The plastic for the first gear wheel is a homogeneous plastic.

As to claim 10, Hiroi et al. teaches the use of a plastic gear wheel (11; see at least Fig. 3) being an injection molded part (see paragraph [0030] lines 4-6) that receives no additional treatment after the injection molding (see paragraph [0015] lines 1-5) to thereby reduce manufacturing costs that would otherwise be expensed by further treatments.

Regarding claim 10, it would have been obvious to one having ordinary skill at the time of the invention to alternatively provide a plastic gear wheel being an injection

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molded part that receives no additional treatment after the injection molding, as taught by Hiroi et al., in the device of KR20020046534 as modified above to thereby reduce manufacturing costs that would otherwise be expensed by further treatments.

As to claim 11, Hiroi et al. teaches the use of the gear wheel that is made of plastic (11) being injection molded onto a hub (12) having raised parts (15) on its outer circumference for the purpose of providing a power transferring gear with teeth, the gear being lightweight, easily customizable, and is easy to manufacture.

Regarding claim 11, it would have been obvious to one having ordinary skill at the time of the invention to alternatively provide a gear wheel that is made of plastic (11) being injection molded onto a hub (12) having raised parts (15) on its outer circumference for the purpose of providing power transferring gear with teeth, the gear being lightweight, easily customizable, and is easy to manufacture

As to claim 15, Hiroi et al. teaches the use of the first gear wheel (11) being made of a homogeneous plastic (see paragraph [0011] lines1-3) for the purpose of providing high dimensional precision that can be attained through an injection molding process.

Regarding claim 15, it would have been obvious to one having ordinary skill at the time of the invention to alternatively provide use of the first gear wheel being made of a homogeneous plastic, as taught by Hiroi et al., in the device of KR20020046534 as modified above for the purpose of providing high dimensional precision that can be attained through an injection molding process.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL YABUT whose telephone number is (571)270-5526. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:00 P.M. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Q. Nguyen can be reached on (571)272-6952. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John Q. Nguyen/  
Supervisory Patent Examiner, Art Unit 4114

/DANIEL YABUT/  
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8/14/2008